

A Work Project, presented as part of the requirements for the Award of a Masters Degree in Finance from the NOVA – School of Business and Economics

## ALMIRANTE

Evaluating the board game

Board game, Startup, Discounted Cash Flow, Venture Capital Method, Real Options

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## Abstract

This thesis evaluates a start-up company (Jogos Almirante Lda) whose single asset is a board game named Almirante. It aims to conclude whether it makes sense to create a company or just earn copyrights. The thesis analyzes the board game's market, as part of the general toy's market, from which some data exists: European countries as well as the USA. In this work it is analyzed the several ways to finance a start-up company and then present an overview of the valuation of the Jogos Almirante based on three different methods: Discounted Cash Flow, Venture Capital Method and Real Options.

## 1. Eureka

It was a shining day in Lisbon when the 12<sup>th</sup> grade schedules of Externato Marista de Lisboa came out. In their last year of high-school (2009-10) three friends: João Cavaco, Pedro Sousa and Pedro Assunção realized they had a very light schedule with classes finishing every day at 30 past noon. Therefore they decided to have lunch at each other's place every day and spend the afternoon hanging around.

During the summer time these afternoons were spent on the outside, drinking beer and traveling through Lisbon. When the autumn and winter came, the afternoon's switched indoors: at first this time was spent playing video-games, but fast changed to watching TV series and movies and then finally into playing board games - the changes on the 'sessions' were always due to boringness of the topic.

The board games 'session' started with *Monopoly*, followed by *Clue*, *Scrabble*, *Settlers of Catan* and *Risk*, but in all games they found boringness: mainly due to the existence of elements of chance that determined the winner. Luck is something built into the game to offer randomness and adjust the skill difference among players. But luck can also be something that hides the true outcome of a game, that was the eureka moment when the 12<sup>th</sup> grade students started developing '*Almirante*' (which means admiral in Portuguese), their own board game, free from all chance.

## 2. Recover the past

On September 2009 College came along, and with it, *Almirante* found 2.5 years of hibernation/maturation. However, after the exchange semester of João Cavaco in Wien, a rediscovery of *Almirante* came along.

And now, with João Afonso and Catarina Brizída as part of the circle of creators, the game evolved to what it is today: ‘Almirante - The Seas Dominance Game’.

The game is designed for 2 to 6 admirals (players) who fight for the dominium of the seas in a fictional world back on the XVI century. The available tools for this goal are the admiral’s fleet, golden coins, winds and god’s prayers.

There are two different types of boats that compose the fleet: fishing boats and galleons (war boats). The first ones are used to earn golden coins through fishing on board game defined spots, the later ones to fight against other admirals.

The resources are golden coins used to build the fleet and the wind is the energy used to move the boats. There is a tradeoff between golden coins and winds, where an admiral can trade golden coins/winds for winds/golden coins always for  $\frac{1}{2}$ .

The final resource are god’s prayers, these are cards/jokers that each player chooses (3 out of 8) from a deck (equal to each player) which allows the admiral to reverse the direction of the game by playing a card (here Game Theory can be applied in the sense that players know the range of options and can deduce each other’s cards by their strategy and bluff).

The goal of each admiral is earn the pre-defined dominium points to reach victory which are from 3 to 5 depending on the number of players. The dominium points are earned by controlling the center of the board with galleons (controlling means having more war boats then your opponents by the end of the admiral turn).

In terms of motivation the game rebuilds a time, 500 years ago, where Portugal and Spain fought for the dominium of the ocean using their fleet carried by the nature

spirit, their budget and waiting for divine help recording the epic novels “Odyssey”, “Iliad” and “Aeneid” and “Lusiadas”.

### 3. The market

A board game is a game that involves counters or pieces which are moved or placed on a pre-marked surface (board), and individuals who play according to a set of rules. The board game market should focus on the substitute products: the ones that come to an individual’s head when deciding to buy a board game like card & dice games and role-playing ones. So, puzzles and miniatures are not included.

#### 3.1 General trends

##### 3.1.1 On the Toy industry

The board game market as defined above is part of the larger toy market (Figure 2), which is a very dynamic and experiences intensive competition on innovation and pricing<sup>1</sup>. Recently, the traditional toys and games industry has experienced increasing competition from video games, which will remain the biggest challenge to the development of traditional toys and games<sup>2</sup>. The global video game market in 2012 reached almost 800 billion dollars retail, whereas the toy market one stayed close to the 80 billion dollars (NPD group, 2012).

The increasing demand amongst consumers for toys with electronic components puts more pressure on the traditional toys and games industry. Tablets and smart phones also compete for attention and preference of children and teenagers as a platform for interactive electronic toys.

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<sup>1</sup> Chee Yew Wong, Jan Stentoft Arlbjørn, John Johansen, (2005) "Supply chain management practices in toy supply chains", *Supply Chain Management: An International Journal*, Vol. 10 Iss: 5, pp.367 - 378

<sup>2</sup> ECSIP Consortium, (2013) “Study on the Competitiveness of the toy industry”. Rotterdam

Overall the toy industry faces some developments that may limit market growth prospects: The number of children has been stable in the USA and shows a declining trend in the EU since the early 2000s (both are the major markets for board games); Children are maturing at an earlier age implying that the playing period is shorter, which will negatively affect the potential market<sup>3</sup>; Children are switching at a younger age from traditional toys and games to video games<sup>4</sup>.

A key marketing question one pose here is whether *Almirante* should be positioned as a game for children or for grownups.

### 3.1.2 On the board game market

Globally per year from 2.000 to 5.000 different board games are launched. Worldwide there are about 57.000 published board games<sup>5</sup>. This market has, since the turn of the century, found a new type of board games: *Risk* and *Monopoly* are games where the players involved are eliminated as time passes, the American-style ones. Now, what are called the German-style board games, players have several ways of winning in order to avoid the elimination system, so in the end of the game all starting players are still “alive”.

The new market trends present a mixture between board games and digital games, that is, turning board games into digital games or vice-versa. An example of a successful board game that turned into a digital one was *Ticket to Ride*, published in 2004 by *Days of Wonder (DoW)* and winner of *Spiel des Jahres (SdJ)*, the Oscar

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<sup>3</sup> Van Lontrigen International (2005) “Toys and Games” European Union market survey

<sup>4</sup> Chee Yew Wong, Jan Stentoft Arlbjørn, John Johansen, (2005) "Supply chain management practices in toy supply chains", Supply Chain Management: An International Journal, Vol. 10 Iss: 5, pp.367 - 378

<sup>5</sup> Board Game Geek (2013) “List of published board games”

prize of board games, which sold over 2 million physical units for \$50 dollars and nearly the same amount for *iPhone* and *iPad* at \$6.99 dollars<sup>6</sup>.

The digital version itself is sometimes just a marketing tool as Mr. Kaufmann (CEO of *DoW*) stated: “Occasionally, we’ll run a promo where you can download the digital version for free. Then, 6 to 8 weeks later, we would see a bump in board game sales.”

The game mechanics did not change from physical to digital, however individuals buy both types for different purposes: the physical one is used to play with friends and family whereas the digital one is designed for one to play bored or alone.

### 3.2 The numbers:

Given the fact that the creator’s market knowledge was more accurate in Portugal, one decided that Portugal would be the pilot test of *Almirante*. Germany, the UK and the USA are the main board game markets. France given the fact that it is the only country that does not belong to *Board Game Geek (BGG)* (an encyclopedia of board games, board gamers and designers) will also be analyzed. Brazil will be part of this analysis due to the fact that it is a Portuguese speaking country and an emerging market where it might be interesting to launch *Almirante*.

On this analysis a comparison between each board game market and the video game one will be done (where console games, internet, tablet and smart phone will be included), given its relevance to the future of the board game industry.

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<sup>6</sup> Melby C.(2013) “Ticket to Ride: How the Internet Fueled a New Board Game Powerhouse” Forbes Magazine

### 3.3 Methodology

To collect the numbers of the board game industry the market database of *NPD group*, *Hasbro's (HAS)* and *Mattel's (MAT)* was used, given that these companies are market leaders on the toy industry, and, for the Portuguese market, since there was no data available, the analysis was done studying the shelf space of both *Continente* and *FNAC*, and used this measure to divide the shelf space dedicated to board games by the total shop floor sales to estimate the board game company sales. Then assumed the markets share both players held - using the sales weight of companies similar to *Jogos Almirante (MESAboardgames (MESA))* and *Tabletip Games (TiG))* – the Portuguese market was estimated.

For the videogame market *The Entertainment Software Association* database was used.

### 3.4 Analysis

The analysis was performed from 2009 until 2012, and showed that Germany and UK were the biggest board game markets, with 2012 values (Exhibit 1) reaching a volume of sales over 500 million Euro's: the market is growing in all the studied countries, with special emphasis on the USA and Brazil. The UK growth was affected by exchange rate effect since the Euro devaluated about 8% towards the British pound.

On the video game market (Exhibit 2) the USA is the leader with a market of 13.000 million Euros, almost 3 times bigger than the second, the UK. The American market grew almost 90%, being only surpassed by Brazil's 97% increase. On an opposite direction Portugal, France and the UK found its market diminishing by as much as 20%.



Looking at board game consumption per capita (Exhibit 3) Germany and UK are the only countries where consumption per capita exceeds 5€, this is explained by the Germany culture highly oriented indoor activities (in the UK case the exchange rate effect is an important explanation) as well as for a higher disposable income. The countries with smaller consumption per capital were Brazil and USA; however both countries were the ones with highest growth.

Comparing both markets, a ratio that divides the total market of video games by the board games was computed (Exhibit 4). The USA ratio is the highest, whereas Germany and Brazil carry the smallest. The only countries where this ratio increased were the USA and Brazil, which is justified by the huge growth rate of the video game market. On all the others, the ratio decreased, with a special highlight in the UK, where it decreased over 30%.

On an overview one finds that both in the USA and Brazil the videogame market is growing faster than the board game one, whereas the opposite happens in all other studied countries.

#### 4. Business Plan Decision: Publisher vs. Independent (Royalties vs. Profits)

There were two main options to launch *Almirante*: either distributing it independently or through a market settled publisher. Not publishing was not an option for the reasoning that the game had added value: since it's positioning on the market was differentiable for four main reasons: 1) The box where the game is stored is a cylindrical prism one rather than the common rectangular prism; 2) The board where *Almirante* is played is a screen of vinyl instead of a card board; 3) The *Almirante* has a combined concept of board game with collectible cards like *Magic*,

which is an unexplored market; It is a no chance game (being the main competitors *Chess* and *Diplomacy*: the first one is only for 2 players, the second one last's over 3 hours, on average.<sup>4</sup>) *Almirante* can be played from 2 to 6 players and has an average game duration between 30 minutes (2 players) and 75 minutes (3 to 6 players).

#### 4.1.1 Financing an Independent Company:

The alternatives to finance *Jogos Almirante* would be through Crowd funding, Venture Capitalists, Family & Friends or by Debt.

Crowd funding is a raising capital mechanism through which an entrepreneur raises capital in small amounts from many people (the most common websites are *Kickstarter*, *gofundme* or *indiegogo*, in Portugal it is PPL – *Tabletip* games, for example, raised capital on this fashion). This alternative would allow for time saving on the financing process and would enable the disadvantage humble entrepreneurs to launch the company from scratch; it allows for smaller payback (in years) enabling complex and time-demanding ideas; would diversify more easily each investors portfolio, given that he/she could invest a small part of his/her budget. However when asking for crowd funding, the entrepreneur will collect less one-on-one debate fundamental for shareholder feedback and convincing capabilities; the number of companies increases, and so does the percentage of failures: today about 90% of start-ups disappear after 2-3 years; the risk of fraud or incompetence is higher.

Venture Capitalist (VC) is an investor or firm that provides capital to start-up or small companies aiming for an injection of equity – these companies are unable to find finance on public funding. Usually VC's looks for signals in the target

enterprise that will allow them to earn a significant future return on their investment (risk they are undertaking). The advantage of VC's versus other financing options is their big budget, which usually allows for a minimum investment between 500 thousand and 5 million dollars (depending on the undertaken share), their knowledge and experience is a valuable asset difficult to evaluate. On the other hand VC's demand high return rates and as they acquire equity the entrepreneur may lose control over his or her company.

Family & Friends are investors that believe, in an act of faith, in the entrepreneur. This financing method might be a loan free from interest making it the cheapest one, however it is very limited in the budget it can finance the start-up with and in relevant knowledge for the future success of the company.

Taking debt, a loan from a bank, is a way of financing which demands more responsibilities and a fixed amount of payment throughout the start-up life (usually very high interests) however it does not take control of the company (unless the company goes bankrupted or if it is a convertible one)

*Jogos Almirante* financing needs amount to 2.000€ given that the associated cost of the first 100 units is 14,90€ per game, and the remaining fixed responsibilities near 400€ per month. If successful, the second phase, meaning the next 500 units, would have a diminished cost due to scale economies, 13,32€, and a deal of paying upfront half of this amount: 3330€ (which is the assumed needed investment).

The financing the company decided to take was through Family & Friends since it was the less risky from the point of view of the company. This was due to the lack

of experience, money and financial cushion, it was also thought that leveraging more committed shareholders would help to enlarge the scope of the project.

#### 4.1.2 Marketing Strategy

*Almirante* will try to be a culture, where an individual reunites his family or friends for a “soirée” to play the board game. The market segmentation done to evaluate the target of the market is by family building level: for instance an individual who just entered the labor market would play *Almirante* on a different environment a parent would (one here is taking out of the scope the board gamers because of their limited dimension as a target market).

On the board game market what differentiates a successful game from a failure is not if the game targeted the right customer, Mr. Hautemont says: “...the big difference is how long they last. To put some things in perspective, the best-selling board game today, in terms of number of units sold, if not profit, is still a game called Monopoly, which was the best-selling title back in 1935. “

*DoW* is a multi-game publishers that on a saturated market only produces in-house digital versions to help mass-market consumers get over their inhibitions about learning new rules – and their sales show that a “failure” still sells 25.000 copies.

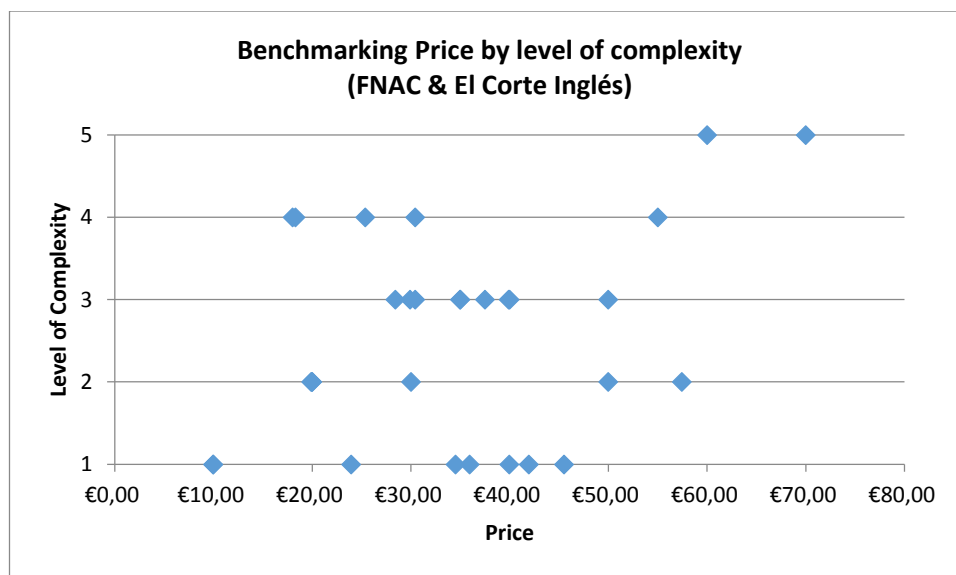
*DoW* founders raised a \$600.000 in funding between themselves and VC friends to create *DoW*. It was the only funding round they ever raised. *DoW* was profitable within 12 months, and now generates \$10 to \$20 million in revenue annually. A story similar to *Jogos Almirante*’s the founders hope.

*Jogos Almirante* sells a board game which is unique in the market, not only for its gaming mechanics but due to its original design. *Almirante* targets two segments.

The primary market segment is composed by young individuals that like to challenge their intellect. The secondary segment are families, to fasten quality time among the members. To experience *Almirante* the key events will be taken in Universities and High Schools, which is an integrated strategy with the packaging and the benefits of the game.

#### 4.1.2.1 Price:

To determine the price at which *Almirante* would be sold in the market one computed a comparable analysis in the Portuguesa board game market on the price of comparable board games:



The above graph differentiates each board game to the associated level of complexity (going from 1 to 5, being 1 the simplest, like *Monopoly* and 5 the more complex one like *Agricola*). This measure was computed through game knowledge, and supported by the average evaluation rank of *BGG* website (the regression between level of complexity and average rank delivered an  $R^2$  of 53%

for 30 observations, and shows a relevant Beta of 0,9 and a relevant Alpha of -3,5).

Under these terms, *Almirante* would be positioned on complexity level 3, together with *Risk* and *Caravelas*, whose average price is 33,44€, therefore Jogos Almirante decided to market *Almirante* at a price of 34,90€ (below *Monopoly* and *Risk*) but at the same level of *Caravelas* and *Quinto Império*.

## 4.3 Valuation

### 4.3.1 Discounted Cash Flows:

On this approach the value of the company is directly related to expectations on its operational performance rather than historical factors as well as macroeconomic variables.

The supports of the DCF are assumptions made on the future cash flows, the discount rate and the terminal value of the company.

The future cash flow map of an independent is presented on exhibit 7 and it is directly correlated with the predicted sales of board games in the stipulated internationalization strategy presented on exhibit 5 (Austria because part of the company's equity is based there: Germany, UK and USA are the biggest world markets). Price (which was already explained), distribution margins and quantity are the main drivers.

For each country there was a price adjustment, based on purchasing power parity. At the quantity level, since the production capacity of *Jogos Almirante* is very small, from near 500 to 3.000 each 6 months, the company sales are restricted by

the supply not by the demand. Though, for each country, associated with forecasted demand the production base will be adjusted. The plan ends in 2019 because after entering the defined markets, organic growth would be the variable defining how many more sales would occur, and the future is uncertain. Therefore one assumed that after this period the company will be sold to an international or domestic publisher.

The discount rate calculation was done finding comparable companies discount rate: *Jogos Almirante* is a publisher, a distributor and a retailer of single board games, and most similar companies like *DoW* or *MESA* are family owned which there is no public financial information. So comparables were publicly traded companies of the toy industry, like *Hasbro*, *Jakks Pacific* and *Mattel*.

	B1	D	E	D/E	ROE	ROA	Cash	C/E	Sales	Bu	Bu adj
HAS	1,31	1,57B	7,02B	22,36%	21,57%	8,12%	619,68M	8,83%	4160	1,16	1,05
JAKK	0,67	253,63M	174,26M	145,55%	-4,20%	1,16%	162,93M	93,50%	655,31	0,36	0,02
MAT	1,15	2,12B	10,37B	20,44%	27,56%	10,37%	518,22M	5,00%	6330	1,024	0,97

Bloomberg

Given that *Jogos Almirante* carries no debt, since it is totally financed by equity, the re-levered Beta would be 0.95. To address the fact that it is a start-up, only exposed to the board game market, a 0.5 discount was incorporated in the Beta value: this can also be explained by the illiquidity factor, the key person discount as well as the survival rate. This led to a 14.18% discount rate (Re). If one chooses a different discount factor, the associated discount rate will change.

The terminal value (TV) computation was done discounting the last half-year cash flow for the company discount rate. On exhibit 9 the sensitivity analysis of DCF

method, shows that *Jogos Almirante* value will be somewhere between 20.000€ and 36.000€, being 30.500 the value with 0,5 discount factor.

The future cash flow map of selling to a publisher was done performing a simulation of the possible distributions of board game sales; it was randomly created 500 distributions with the inputs being the weekly decrease rate of sales after the launching, the Christmas increase of sales in week 46 and the after Christmas bump. The limitation of each distribution was the assumption that the starting week would be in the 1<sup>st</sup> of January with sales at 50 units (exhibit 7 shows the average of this distribution over 4.5 years multiplied by the royalties of 10% and the assumed price of 17€) and that every 1<sup>st</sup> year weekly sale would be smaller than the last year one. The value of selling was done by discounting the cash flows at a defined discount rate (exhibit 8). If 10%, the opportunity cost of capital, the value would be 17.000€.

A problem of DCF valuation is the fact that it is as good as the Re assumptions, the TV calculations (here a small percentage of the company value) and the cash flow projection scenario. The DCF does not account for the fact that there are biannual decision points where the manager team can decide to continue or sell it. As well as the fact that in different countries the associated risk of the project is different from the company one.

#### 4.3.2 Venture Capital Method (VCM):

The method measures the demanded return of a venture capitalist, assuming that he or she will be exiting the company on a 3-7 years period. For this reasoning,



there is an associated exit price, a terminal value, and a demanded target rate for the venture capitalist investment.

Target Rate:

Start Up	50-70%
First Stage	40-60%
Second Stage	35-50%
IPO	25-35%

Lerner J., Willinge J. "A note on valuation in private equity settings", Harvard Business School, 2011

To determine the company terminal value, one should use a multiple of similar companies selling price – since most of these companies were family owned until they were sold, one decided to study the acquisitions done on the toy industry by the 3 biggest players: *Hasbro*, *Mattel* and *Jakks Pacific* (exhibit 6).

The goal of this method is to determine venture capitalist ownership interest on the company. Assuming that the needed investment is 3.300€ in January 2015, the target rate (TR) is 50%, since *Jogos Almirante* is still on its first stage (from 40% to 60%) and the venture capitalist will exit the company half way through 2019 for a terminal value (TV) equal to the average of the industry acquisition's Price to Net Income (PER) times the discount factor: 5,73.

Since both the TR and the TV are highly volatile numbers and important for the company value (V), a sensitivity analysis was created on this numbers (exhibit 10). A change in the TR, from 35% to 60% would change the company value from 19.916€ to 14.116€, assuming a PER of 5. An integrated change on PER and the TR vary, from 0 to 10 and from 35% to 60%, would value company from 13.686€ to 20.610€. Using the 5.73 PER, the ownership of the VC would be 125%, turning *Almirante* into a totally controlled investment.

It is senseless to analyze the value of selling *Almirante* right away to an international player through VCM, since there is no initial investment needed.

This method is a discount cash flow valuation mechanism, suffering from the same issues DCF method has.

#### 4.3.3 Real Options:

On ordinary option theory, to value an option the maturity, the discount rate, the current asset price, the strike price and the volatility are the drivers to be aware of.

The valuation approach on real options will be made by adding each country's project (under internationalization plan), and assuming each project itself a sum of 6 months real options, since the decision point will be taken every 6 months ( $T=0,5$ ), where continuing or selling the product will be defined. If one decides to abandon, it was assumed that, given the presented offers from Portuguese publishers, there would also be offers from international players, of 10% on future sales.

Since it is predicted, through the already mentioned internationalization strategy that Jogos *Almirante* will be launching *Almirante* not only in Portugal but also in Austria, Germany, UK and the USA, each of these launches will be a different project, with a different risk from each other and from the company associated discount rate. The reasoning behind this logic is the fact that each project would be financed by investors on each country, just like the strategy built in Portugal. In this way the project in each country would be independent from the mother company and solely exposed to the country macroeconomic environment.

To discover each country discount rate the associated risk of each country was found: the methodology used was discovering the unlevered Beta of companies that were mainly or only exposed to that country's environment and there each country average was found. This data was collected by selecting a country specific stock exchange, consumer cyclical companies and small capitalization companies. Given that these information came from companies with more liquidity than *Jogos Almirante* and were mature a start-up discount factor of 0.5 was included.

The current asset price was the 6-month expected revenues of the company. For the expected value it was assumed that the company revenues followed a normal distribution: since the production capacity 500-6.000 per semester, the best case scenario would be to sell 500-6.000 every 6 months and the worst would be to sell 0 every half-year. Therefore, the average would be 250-3000 units, and the current asset price the number of units times the distributor's price, which changed from country to country. The volatility of sales were assumed to take 3 sigma's to reach the upper and the lower limit of the normal distribution:  $((500-250)/3)/250$ , so 33%.

The strike price was defined as the Break Even Point of sales, the starting investment made by *Jogos Almirante* Lda: 3300€, which is 50% of the cost of producing 500 units.

Since the assumption on the start-up factor is very naïve one decided to build a sensitivity analysis on the company's discount rate as well as each project discount rate and the final company value (exhibit 11). This discount rates are 6-month ones and provide a company value between 41.403,60€ and 35.449,31€.

The projects in England and Germany are less risky than the company one given the fact that the company risk captures projects in the USA and Portugal (being Portugal the company headquarters and therefore the country whose economy influences the most the company's value).

### Conclusions:

Should *Almirante* be sold or should a company be created to launch it, taking all the economic sense of utility and learning of creating a company from scratch out, the one with less risk (0) would be earning royalties on sales, so the value of *Almirante* for creators would be a number divided by zero: infinity. If the discount rate is not the risk but the opportunity cost - instead of selling to an independent publisher do it by itself creating a company - then it should be a value between 0 and the discount rate of the company, for instance the expected return: selling values more than creating if the discount rate is smaller than 1,5% (DCF), than 12,5% (VCM) and 0,9% (Real Options).

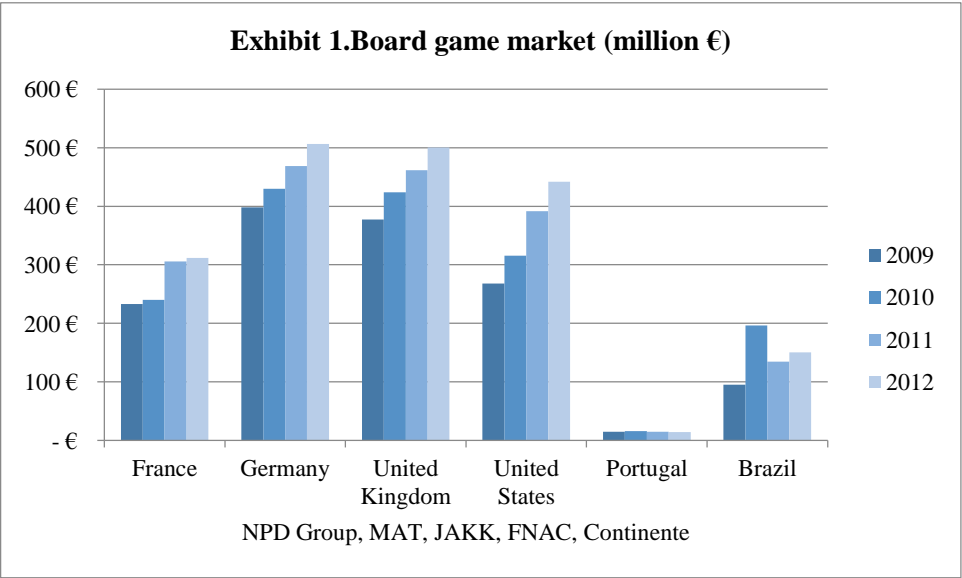
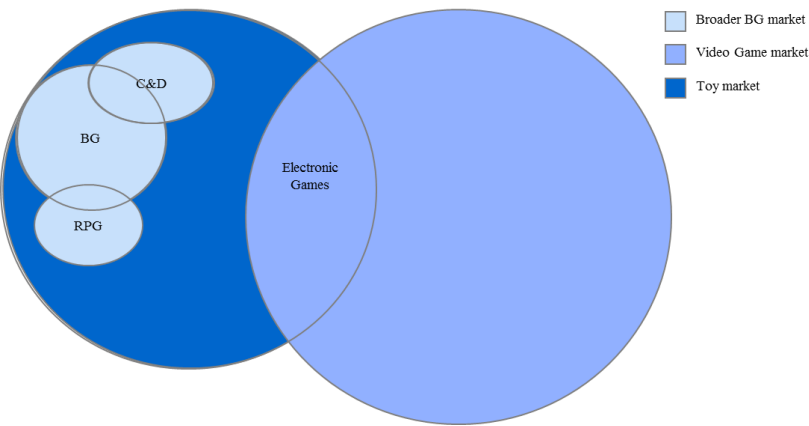
Valuing the company, *ceteris paribus*, yields a bigger value through Real Options, then DCF and afterwards VCM. Only through VCM the decision would be selling to a publisher. Therefore, since Real Options is the more accurate method *Jogos Almirante Lda* was created, and depending on the future *Almirante* will be (or not be) sold. So, the value of *Jogos Almirante* is 40.000€, assumed a 0.5 discount factor.

Appendix:

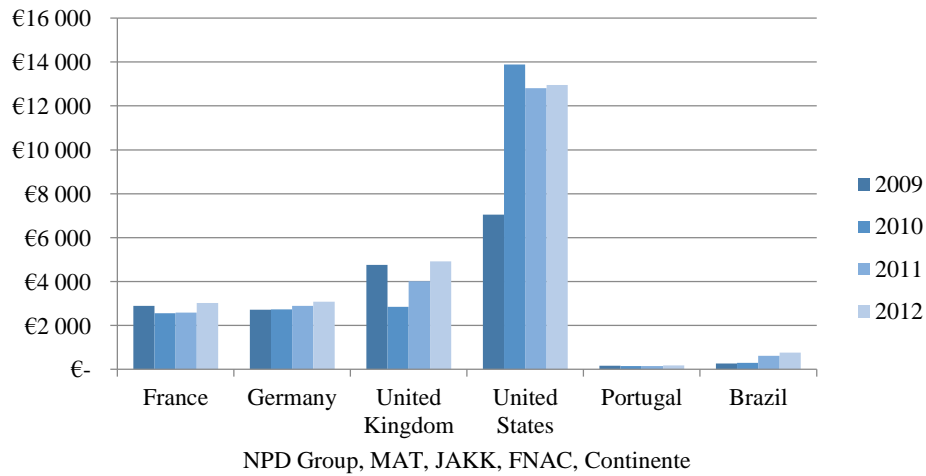
Figure 1: The product



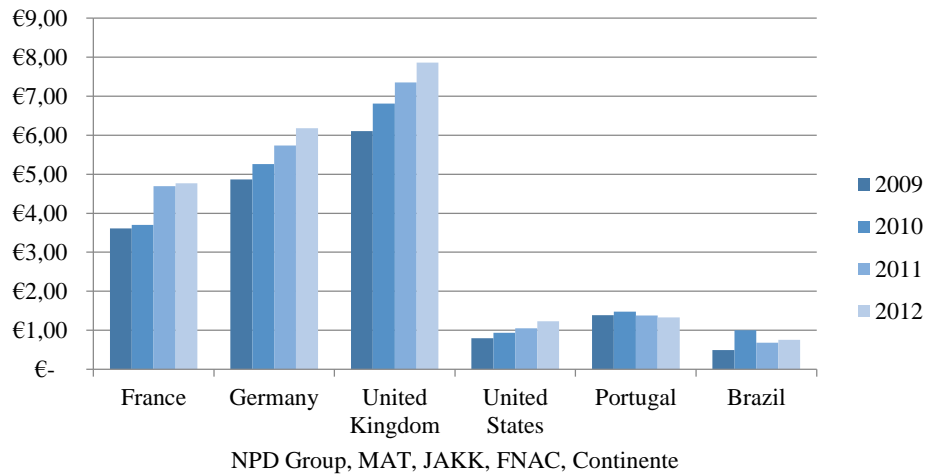
Figure 2: Entertainment Market



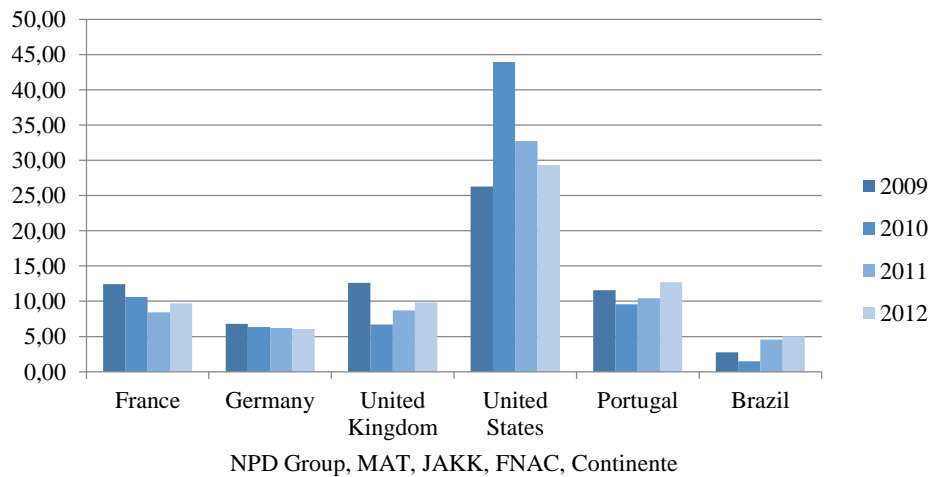
**Exhibit 2.Video game market (million €)**



**Exhibit 3.Board game consumption/capita (€)**



**Exhibit 4.Video game/Board game multiple**



## Exhibit 5: Internationalization Map



Units	2015	2015,5	2016	2016,5	2017	2017,5	2018	2018,5	2019	2019,5
<b>POR</b>	595	500	500	-	-	-	-	-	-	-
<b>AUS</b>	-	500	500	1000	1000	-	-	-	-	-
<b>ENG</b>	-	-	-	500	500	1000	1000	-	-	-
<b>GER</b>	-	-	-	500	500	1000	1000	-	-	-
<b>USA</b>	-	-	-	-	-	-	1000	1000	500	500
<b>Tt</b>	595	1000	1000	2.000	2.000	2.000	3000	1000	500	500

## Exhibit 6: Comparable Acquisitions

COMPARABLES SELLING PRICE (million \$)							
	Selling price	Acquirer	Year	Revenues	Net Income	P/R	P/NI
<b>Tonka</b>	\$ 516,00	Hasbro	1991	\$541,30	\$61,30	0,95	8,42
<b>Backflip</b>	\$ 112,00	Hasbro	2013	\$32,00	\$6,40	3,50	17,50
<b>Disguise</b>	\$ 55,90	Jakks	2008	\$106,50	\$13,10	0,52	4,27
<b>Creative Design Int.</b>	\$ 116,50	Jakks	2006	\$142,80	\$28,40	0,82	4,10
<b>Play Along Toys</b>	\$ 115,00	Jakks	2004	\$158,00	\$30,00	0,73	3,83
<b>HiT Entert.</b>	\$ 680,00	Mattel	2011	\$180,00	\$71,58	3,78	9,50
<b>King</b>	\$ 495,00	IPO	2013	\$63,90	\$ -1,30	7,75	-380,77
<b>Zynga</b>	\$ 1.000,00	IPO	2010	\$ 90,60	\$30,70	11,04	32,57

Bloomberg

*Hasbro* is an American multinational with market capitalization of 7 billion dollars, revenues a little bit over 4 billion dollars, a gross margin of 50%, an operating margin of 13%, with EPS of 2.44 and a P/E close to 23. It has the copyright of *Monopoly*, *Risk*, *Clue*, *Magic* and *Pokémon*. Has 5.000 full time employees.

*Jakks Pacific* is an American company that markets and designs toys and commercial products, it has a market capitalization of 0,173 billion dollars, a gross margin of 29%, an operating margin of 1%, with negative EPS of 0.22 in 2013. Has 758 full time employees. It's best known products are the ones with international trademarks like *Disney*, *Warner Bros*, *Star Wars* or *Nintendo*.

*Mattel* is an American toy manufacturer with market capitalization of 10 billion dollars, revenues of over 6 billion dollars, a gross margin of 52%, an operating margin of 17%, with EPS of 2.33 and a P/E of 13. It's best known products are *Barbie* or *Hot Wheels*. Has 29.000 full time employees.

#### Exhibit 7: Cash Flow Map

Independent	2015,5	2016	2016,5	2017	2017,5	2018	2018,5	2019	2019,5
Normal St. Rev.	2.582 €	2.582 €	5.961€	5.961€	5.961€	9.340 €	2.582€	892€	892€
Good St. Rev.	5.164 €	5.164€	11.922€	11.922€	11.922€	18.680€	5.164 €	1.785€	1.785€
Bad St. Rev.	258€	258 €	596€	596 €	596€	934€	258€	89€	89€
Selling	2015,5	2016	2016,5	2017	2017,5	2018	2018,5	2019	2019,5
Quantity sold	371	2761	109	2756	109	2756	109	2756	109
Revenues	630€	4.694€	186 €	4.685 €	186 €	4.685 €	186 €	4.685 €	186 €

#### Exhibit 8: Sensitivity Analysis of Value of Selling to a Publisher

DR	Value
1,00%	37.307,13 €
1,50%	30.893,99 €
2,50%	25.509,48 €
5,00%	20.785,08 €
7,50%	18.627,14 €
10,00%	17.168,07 €
12,50%	16.027,47 €
15,00%	15.073,78 €
17,50%	14.247,23 €
20,00%	13.515,41 €

#### Exhibit 9: Sensitivity Analysis of Jogos Almirante Lda through DCF (annual Re)

Factor	Re	TV	V
0	9,48%	9.421,89 €	35.940,47 €
0,25	11,83%	7.549,30 €	32.892,11 €
0,5	14,18%	6.297,65 €	30.547,61 €



<b>0,75</b>	16,53%	5.402,02 €	28.634,42 €
<b>1</b>	18,88%	4.729,41 €	27.012,81 €
<b>1,25</b>	21,23%	4.205,75 €	25.602,66 €
<b>1,5</b>	23,58%	3.786,50 €	24.354,03 €
<b>1,75</b>	25,93%	3.443,25 €	23.233,73 €
<b>2</b>	28,28%	3.157,07 €	22.218,47 €
<b>2,25</b>	30,63%	2.914,80 €	21.291,21 €

Exhibit 10: Sensitivity Analysis of Jogos Almirante Lda through VCM (annual TR)

TR/PER	0	2	4	5	6	8	10
<b>35%</b>	18.990 €	19.453 €	19.684 €	19.916 €	20.147 €	20.378 €	20.610 €
<b>37,5%</b>	18.310 €	18.736 €	18.949 €	19.162 €	19.375 €	19.588 €	19.801 €
<b>40%</b>	17.669 €	18.062 €	18.259 €	18.455 €	18.651 €	18.848 €	19.044 €
<b>42,5%</b>	17.067 €	17.430 €	17.611 €	17.792 €	17.974 €	18.155 €	18.336 €
<b>45%</b>	16.499 €	16.834 €	17.002 €	17.170 €	17.337 €	17.505 €	17.673 €
<b>47,5%</b>	15.963 €	16.273 €	16.429 €	16.584 €	16.739 €	16.895 €	17.050 €
<b>50%</b>	15.456 €	15.744 €	15.888 €	16.032 €	16.176 €	16.320 €	16.464 €
<b>52,5%</b>	14.977 €	15.245 €	15.378 €	15.512 €	15.646 €	15.779 €	15.913 €
<b>55%</b>	14.524 €	14.772 €	14.896 €	15.021 €	15.145 €	15.269 €	15.393 €
<b>57,5%</b>	14.094 €	14.325 €	14.440 €	14.556 €	14.672 €	14.787 €	14.903 €

Exhibit 11: Sensitivity Analysis of Jogos Almirante through Real Options (0.5 year rates)

Discount factor	Austria	England	Germany	USA	Re	V
<b>0</b>	2.99%	3.88%	3.36%	5.74%	4.63%	41.403,60 €
<b>0.25</b>	4.19%	5.06%	4.56%	6.91%	5.75%	40.659,89 €
<b>0.5</b>	5.37%	6.24%	5.74%	8.06%	6.85%	39.956,17 €
<b>0.75</b>	6.54%	7.40%	6.90%	9.21%	7.95%	39.289,31 €
<b>1</b>	7.70%	8.55%	8.06%	10.34%	9.03%	38.656,52 €
<b>1.25</b>	8.85%	9.69%	9.20%	11.46%	10.10%	38.055,28 €
<b>1.5</b>	9.98%	10.81%	10.33%	12.56%	11.17%	37.483,31 €
<b>1.75</b>	11.10%	11.93%	11.45%	13.66%	12.22%	36.938,53 €
<b>2</b>	12.21%	13.03%	12.56%	14.75%	13.26%	36.419,06 €
<b>2.25</b>	13.31%	14.12%	13.65%	15.82%	14.29%	35.923,17 €

